Exhibit C

Second Edition

HANDBOOK OF PULP & PAPER TERMINOLOGY

A Guide to Industrial and Technological Usage

by Gary A. Smook

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CARBON DISULFIDE: (CS_2) Colorless, volatile liquid with a characteristic odor, used as a solvent in the viscose process. Syn. Carbon Bisulfide.

CARBONYL GROUP: Divalent organic radical C=O, characteristic of aldehydes, ketones and carboxylic acids. Carbonyl groups are formed on the cellulose molecule during bleaching.

CARBOXYL GROUP: Radical -COOH of an organic acid. Carboxyl groups are formed on cellulose fibers by oxidation during pulping and bleaching processes. In paper pulps, the carboxyl groups contribute to the bonding of fibers and to the retention of rosin size; but these groups also provide ion exchange capacity, and absorbed cations contribute to discoloration during drying.

CARBOXYMETHYLCELLULOSE (CMC): Cellulose in which CH_2COOH groups are substituted on the glucose units of the cellulose chain through an ether linkage. Since the reaction takes place in alkaline media, the usual product is the sodium salt. It is a hydrophilic colloid with physical properties that depend on the extent of etherification. CMC has found application as a pigment coating binder.

CATALYST: Substance that promotes or accelerates a chemical reaction without being consumed by it. A catalyst may either be unaffected by the reaction or enter into the reaction and then be reformed.

CELLOBIOSE: Alternating arrangement of two glucose residues. Cellobiose units are joined together to form molecular chains of cellulose. See also MALTOSE.

CELLOPHANE: Generic name for transparent film of regenerated cellulose used for wrapping.

CELLULASE: Extracellular enzyme produced during the growth of fungi, bacteria, insects and other lower animals that hydrolyzes cellulose.

CELLULOLYTIC: [adj] Term used to describe organisms that have the ability to hydrolyze cellulose.

CELLULOSE: $(C_6H_{10}O_5)_n$ Material that forms the solid framework or cell walls of all plants; the most abundant organic compound in nature. It is a straight-chain (linear) polysaccharide composed of repeating glucose residues (or more precisely, cellobiose units), the number of which can vary over a wide range.

CELLULOSE ACETATE: White, flaky material produced by acetylation of cellulose, of which two forms are commercially important. A modified, partially hydrolyzed form (DS of 2.2 to 2.5) is used in the production of fibers, films and plastics. The "triacetate" (DS of at least 2.8) is used in the production of fibers. Most cellulose acetate products are made by solvent evaporation methods. See also DEGREE OF SUBSTITUTION.

CELLULOSE ACETATE BUTYRATE: White flaky material produced according to butyrol content by reacting cellulose with various mixtures of acetic and butyric anhydrides, used for molding compositions.

CELLULOSE ESTER: Cellulose in which the free hydroxyl groups have been replaced wholly or in part by acidic groups, e.g., cellulose acetate, cellulose propionate.

CELLULOSE ETHER: Cellulose in which the free hydroxyl groups have been wholly or partially converted to ethers by reaction with alcohols, e.g., methyl cellulose, ethyl cellulose.

CELLULOSE FIBER: Natural cellulosic material derived from wood or other plant materials by pulping and bleaching operations.

CELLULOSE FILM: See CELLOPHANE.

CELLULOSE MODIFICATION: Chemical reaction by which some or all of the substituent radicals of cellulose are replaced by other chemical entities (for example, hydroxyls replaced by carboxyl or alkyl radicals). Modified cellulose retains its general structure, but has altered properties.

CELLULOSE NITRATE: Product obtained by treating cellulose with a mixture of concentrated nitric and sulfuric acids, used as explosive and propellant. Syn. Nitrocellulose.

CELLULOSE PROPIONATE: White flaky material produced by reacting cellulose with propionic anhydride, used for molding compositions.

CELLULOSE TRIACETATE: See CELLULOSE ACETATE.

CELLULOSE VISCOSITY: Property of a pulp or other cellulosic material which is expressed by the viscosity of a dilute solution of the material in a suitable solvent under specified conditions. The viscosity is related to the molecular DP, and thus to the strength and other properties of the fibers. See also CUENE.

CELLULOSIC: Collective term referring to any of the numerous compounds and products made by reacting cellulose with various chemicals, usually involving substitution of the hydroxyl groups of the cellulose. The products include regenerated cellulose (e.g., rayon or cellophane), cellulose acetate, nitrocellulose, and methylcellulose.

CHEMICAL ACCESSIBILITY: Extent to which cellulose and other carbohydrates are available for chemical reactions, a function of the index of order.

CHEMICAL ANALYSIS: Analytical method using chemical techniques.

CHEMICAL CELLULOSE: Highly processed pulp with high alpha cellulose content, used for chemical conversion into such products as viscose rayon and cellulose acetate. Syn. Dissolving Pulp.

CHEMICAL COTTON: Chemical cellulose prepared from cotton, usually from cotton linters.